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Case Report

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A case report of history of anterior myocardial infarction complicated with left ventricular pseudoaneurysm

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ABSTRACT

Pseudoaneurysm, which is a fatal complication of myocardial infarction and occurs when left ventricular rupture is limited by the pericardium and hematoma, is a mortal complication that allows life to continue compared to rupture. In this case report, we tried to discuss the successful management of a 61-year-old male patient who applied to our clinic with a complaint of chest pain and dyspnea, from diagnosis to surgery, within the literature.

Keywords: Left ventricle, pseudoaneurysm, echocardiography

INTRODUCTION

Left ventricular pseudoaneurysm (LVP) is a rare but catastrophic complication of myocardial infarction (MI). In addition, it could develop after infection, trauma, and valvular or ventricular surgery. LVP occurs when cardiac rupture is limited by the pericardium and scar tissue.1 The incidence of left ventricular pseudoaneurysm after MI is around 0.2-0.3%.2 Patients with left ventricular pseudoaneurysm may be asymptomatic or present to the clinic with a wide range of symptoms, including congestive heart failure (CHF), chest pain, dyspnea, arrhythmia, tamponade, syncope and sudden cardiac death.[1,2]

Ventricular pseudoaneurysm after inferior MI is twice as common as pseudoaneurysm after anterior MI.[3] If LVPA occurs after MI, it may have an insidious course and the patient may present to outpatient clinics and emergency departments with atypical findings. The rupture risk of pseudoaneurysm is inversely proportional to the time elapsed after acute myocardial infarction. This period is important in the classification and treatment management of pseudoaneurysms. In pseudoaneurysm, as time passes after MI, the cavity stabilizes and the risk of rupture gradually decreases. Otherwise, the risk of rupture depends directly on the size of the ischemic necrotic area and the wall stress in the aneurysm sac.[3]

LVPA, which should be considered especially in post-MI patients with unexplained clinical symptoms such as dyspnea or angina, can be evaluated with transthoracic echocardiography. Although it is known that surgical intervention is still superior to medical treatment, its mortality is high with a rate of 7-30% (Inayat F, Ghani AR, Riaz I, et al. Left ventricular pseudoaneurysm: An overview of diagnosis and management. J Investig Med High Impact Case Rep. 2018;6:2324709618792025). The indication for surgery in the treatment of pseudoaneurysm is determined by heart failure, syncope, ventricular arrhythmia, the possibility of thromboembolic complications, and the risk of rupture.[4]

In this case report, we discussed the successful management of a 61-year-old male patient who applied to our clinic with a complaint of chest pain and dyspnea, from diagnosis to surgery.

CASE

A 61-year-old male patient was admitted to the cardiology outpatient clinic with complaints of chest pain and dyspnea. In the assessment, it was learned that the patient had a stent applied to the left descending artery (LAD) three years ago with the diagnosis of acute anterior MI and that he was diagnosed with hypertension and chronic obstructive pulmonary disease. It was learned that the patient was using acetylsalicylic acid 81 mg, nebivolol 5 mg, ramipril 5 mg, spironolactone/hydrochlorothiazide 25/25 mg, and atorvastatin 20 mg. During the physical examination of the patient, his blood pressure was measured as 100/70 mmHg and his heart rate was 84 beats/min. In the cardiovascular auscultation of the patient, a grade 2 systolic murmur was detected in the apical area as well as S1 and S2. The electrocardiogram showed normal sinus rhythm at 100 beats/min and biphasic T waves with 1 mm aneurysmatic ST elevation along with loss of R progression in leads V2-6.

In the echocardiography performed on the patient, the ejection fraction was measured as 40%. An aneurysmatic area

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with hypoechoic fluid collection was observed in the apical region, with an appearance compatible with hyperechoic thrombus (Figure 1). In the patient's thorax computed tomography, a 50x35 mm cardiac apical partially thrombosed aneurysm with chronic infarction sequelae was observed (Figure 2 and Figure 3).

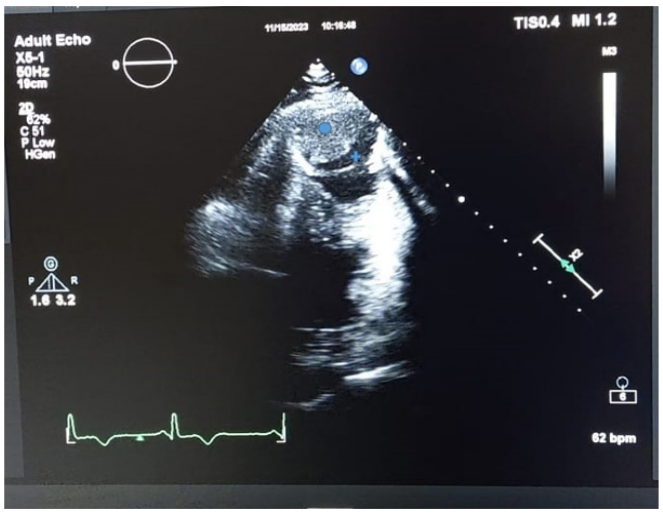

Figure 1. Two-chamber echocardiography image shows an aneurysmatic area with hypoechogenic fluid

Figure 2. Pseudoaneurysm in the left ventricular apical region on contrast-enhanced thoracic computed tomography

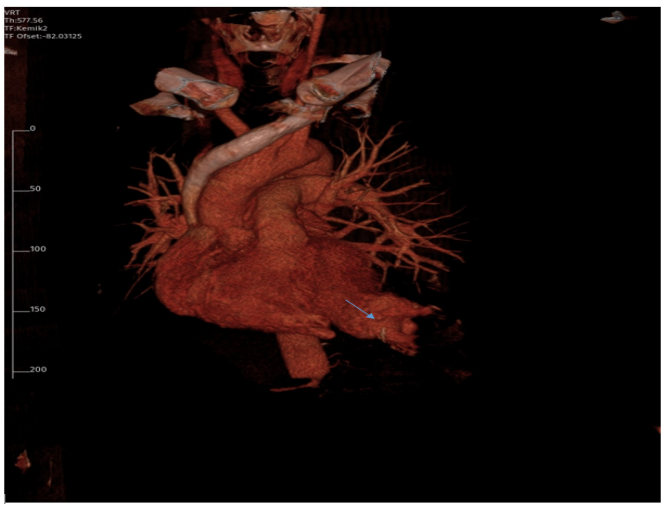

Figure 3. Three-dimensional view of left ventrilular pseudoaneurysm on three-dimensional thoracic computed tomography

Coronary angiography was planned for the patient who had class 2 angina according to the Canadian Heart Association angina classification. In the invasive angiography performed on the patient, the stent was open in the proximal region of the left descending artery and 90% stenosis was observed in the distal region (Figure 4).

Figure 4. Critical stenosis after distal LAD stenting

The patient was evaluated by the council, which also included cardiovascular surgery. Since the LAD distal lesion was not suitable for bypass, it was decided to apply a stent to the LAD. A 2.5*15 mm stent was implanted in the distal region of the left descending artery (Figure 5).

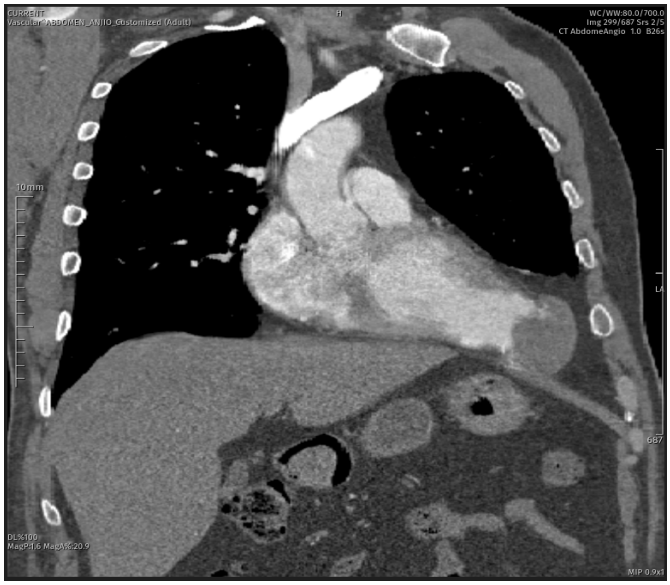

Figure 5. View after 2.5*15 mm stent implantation to the distal LAD

It was decided to follow the patient with medical treatment and to add anticoagulant therapy to his medication due to a thrombus in the left ventricular region. The patient's medication was arranged as warfarin 5 mg, clopidogrel 75 mg, nebivolol 5 mg, ramipril 5 mg, spironolactone/hydrochlorothiazide 25/25, atorvastatin 20 mg.

Since the patient's dyspnea continued at the first check-up after stent implantation, the patient was re-evaluated by the council and a decision was made for aneurysmectomy. The patient is still being followed up asymptomatically by the cardiology clinic after surgery.

DISCUSSION

True ventricular aneurysm is characterized by a ventricular aneurysm involving all myocardial layers, including the endocardium. LVP, on the other hand, is a structure that connects the ventricle to a larger aneurysmatic area with a narrow neck, contains blood and thrombus, and terminates with pericardial fibrous tissue rather than myocardial tissue. It occurs when the free wall rupture of the ventricle heals with an organized thrombus along with pericardial scar tissue. Rupture is rare after fibrosis and scar tissue have formed. The risk of rupture is higher in the first year with a rate of 30-45%.[5]

Although there is no consensus on the treatment of left ventricular pseudoaneurysm, if it occurs within the first three months after acute myocardial infarction and its diameter is larger than 3 cm, emergency surgery is the treatment method.[6] However, it is also possible to follow up patients with LVP with conservative treatment. In a study conducted on patients followed with medical treatment in this way, the one-year and four-year survival rates of the patients were found to be 89% and 74%. The basis of medical treatment is blood pressure management and anticoagulant treatment due to the high risk of thromboembolism.[7] While the surgical mortality rate of left ventricular pseudoaneurysms is 23%, the mortality rate of patients followed with medical treatment is 48%.[3] In LVP surgery, there are risks such as adhesion, increased fragility, and systemic embolization of thrombosed material in the pseudo aneurysmatic area during ventricular dissection as a result of the healing of ruptured tissue by fibrosis.8 Percutaneous closure is not a frequently used method; The experience of surgeons remains limited at this point. It limits this method to patients who are considered to be at high risk for surgery.[9]

In the current case, surgery (CABG and aneurysmectomy), percutaneous closure, and medical treatment were among the possible options. However, in the presented case, the fact that no objective distinction could be made as to whether the symptoms were caused by LVP or ischemia, and the fact that the risk of possible rupture was thought to be low since the patient was in the third year of post-MI suggested that this patient could be followed up with medical treatment. However, since the patient was symptomatic despite the medical treatment after the stent, the council decided on surgery. Each option chosen is associated with increased mortality. There is no consensus as to which method would be more appropriate for which patient. All these reasons make the management of patients with LVP more difficult.[9,10]

CONCLUSION

LVP can be seen in the early post-MI period, or it can be seen after three years, as in our case. Early diagnosis of LVP is of vital importance in determining prognosis and treatment methods. It is a diagnosis that can be easily missed unless evaluated with high clinical suspicion of two-dimensional echocardiography. Although echocardiography is the first evaluation method in diagnosis, methods such as invasive imaging methods, contrast-enhanced computed tomography, and cardiac MRI allow more efficient imaging.

In a patient with left ventricular pseudoaneurysm, determining the indication for surgery and ensuring that the right patient undergoes surgery, as well as diagnosis by imaging, are important due to the high risk of intraoperative mortality.

ETHICAL DECLARATIONS

Informed Consent

All patients signed and free and informed consent form.

Referee Evaluation Process

Externally peer-reviewed.

Conflict of Interest Statement

The authors have no conflicts of interest to declare.

Financial Disclosure

The authors declared that this study has received no financial support.

Author Contributions

All of the authors declare that they have all participated in the design, execution, and analysis of the paper, and that they have approved the final version.

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